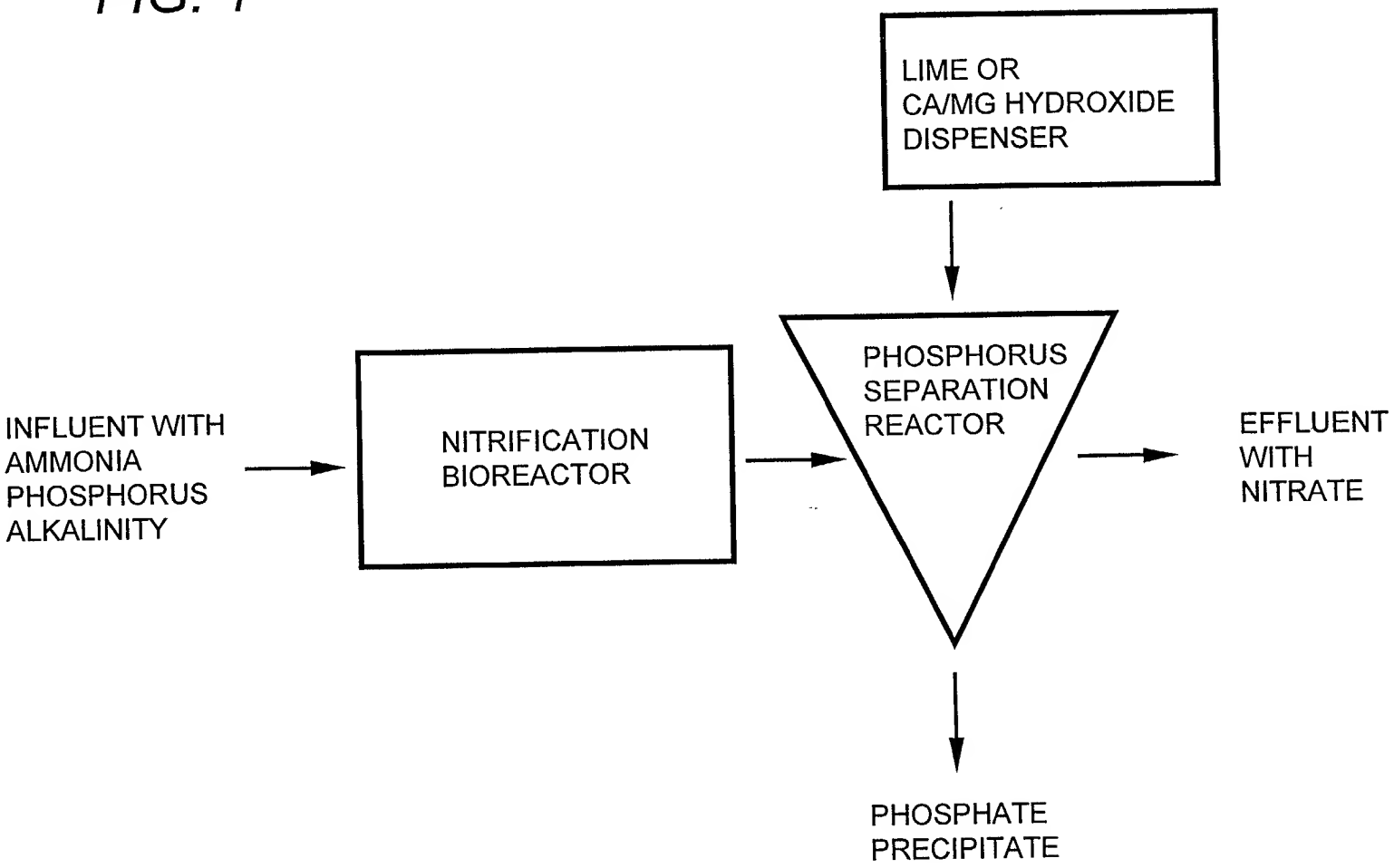
FIG. 1



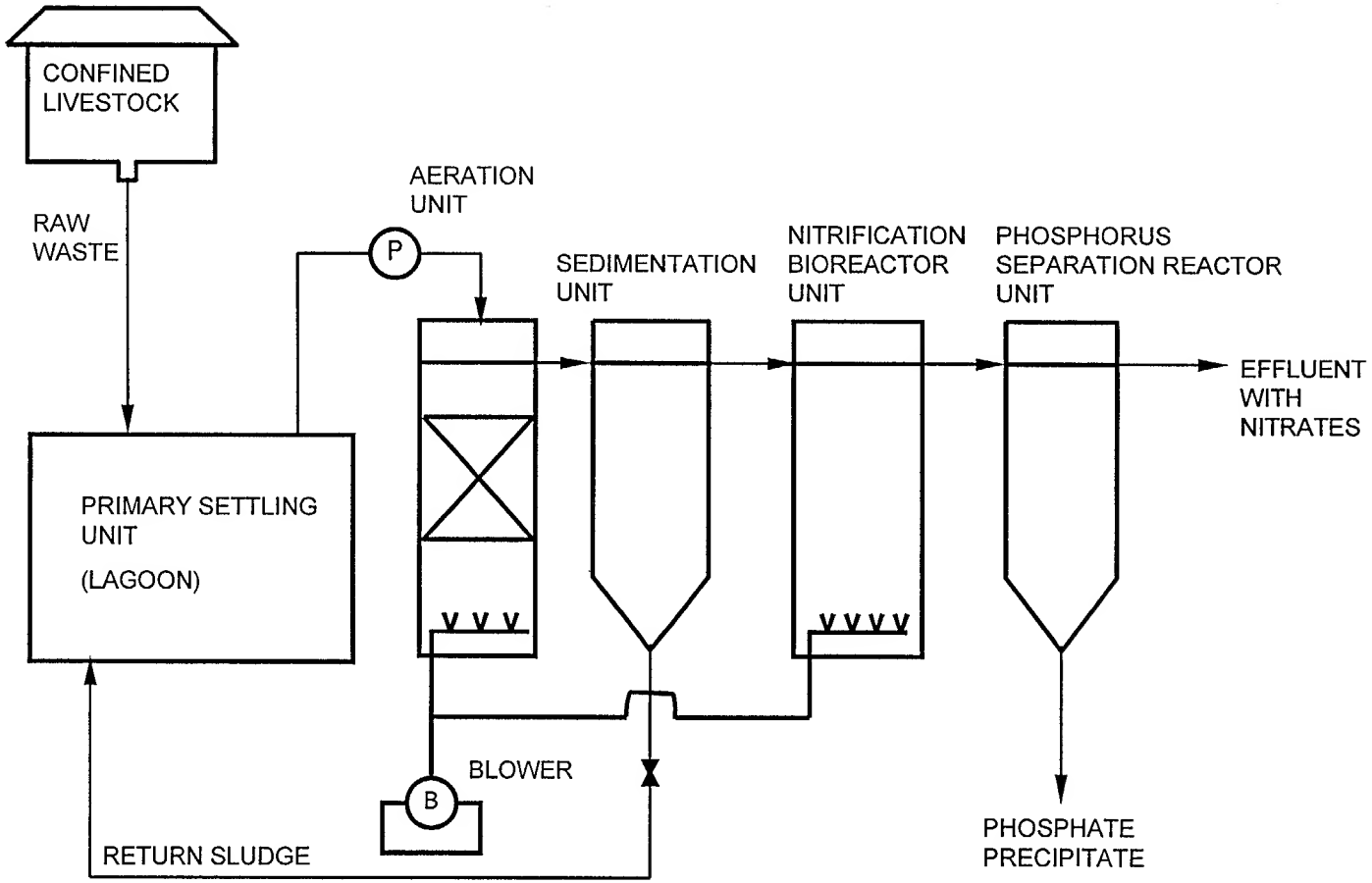
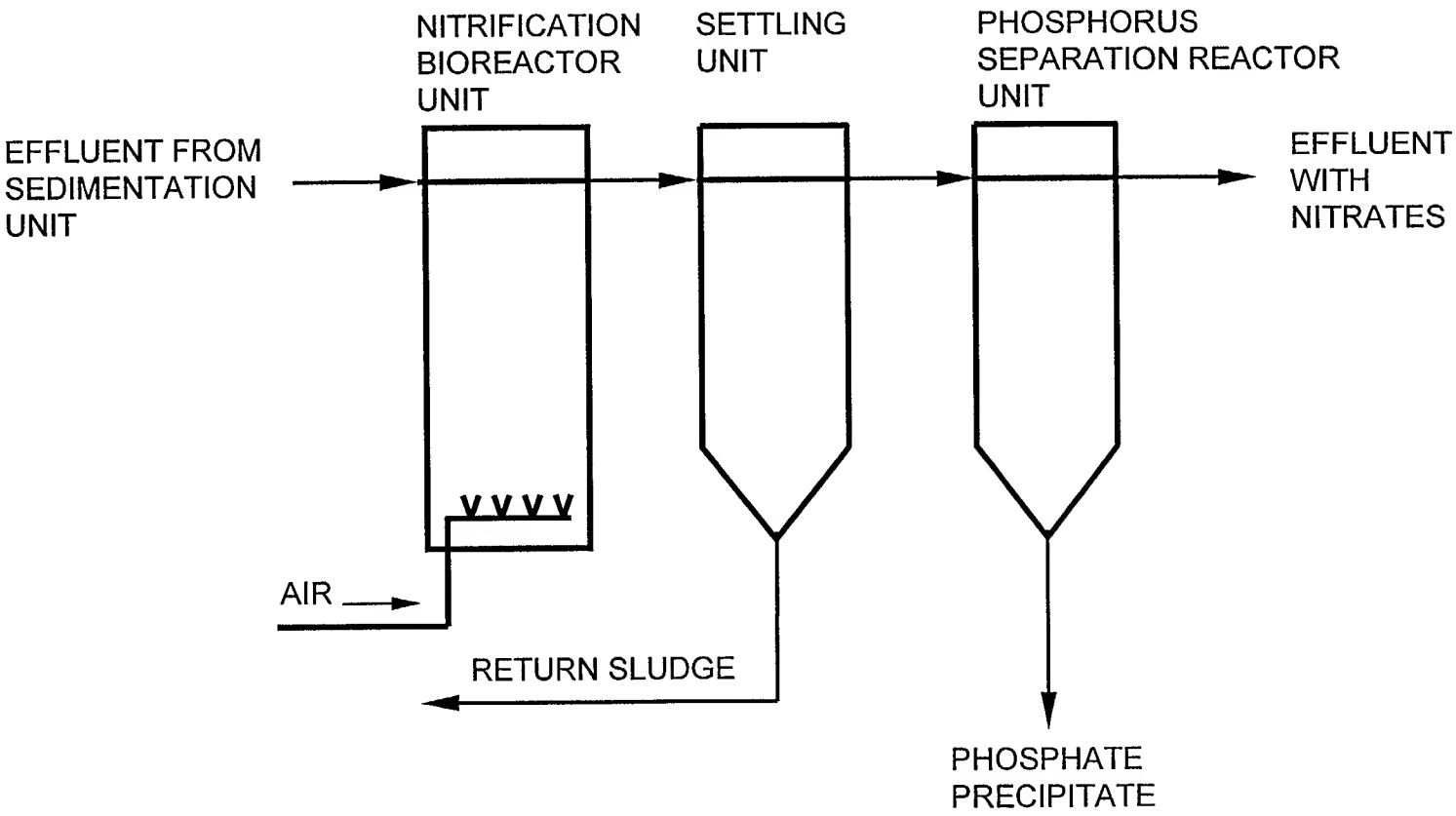


FIG. 2

FIG. 3



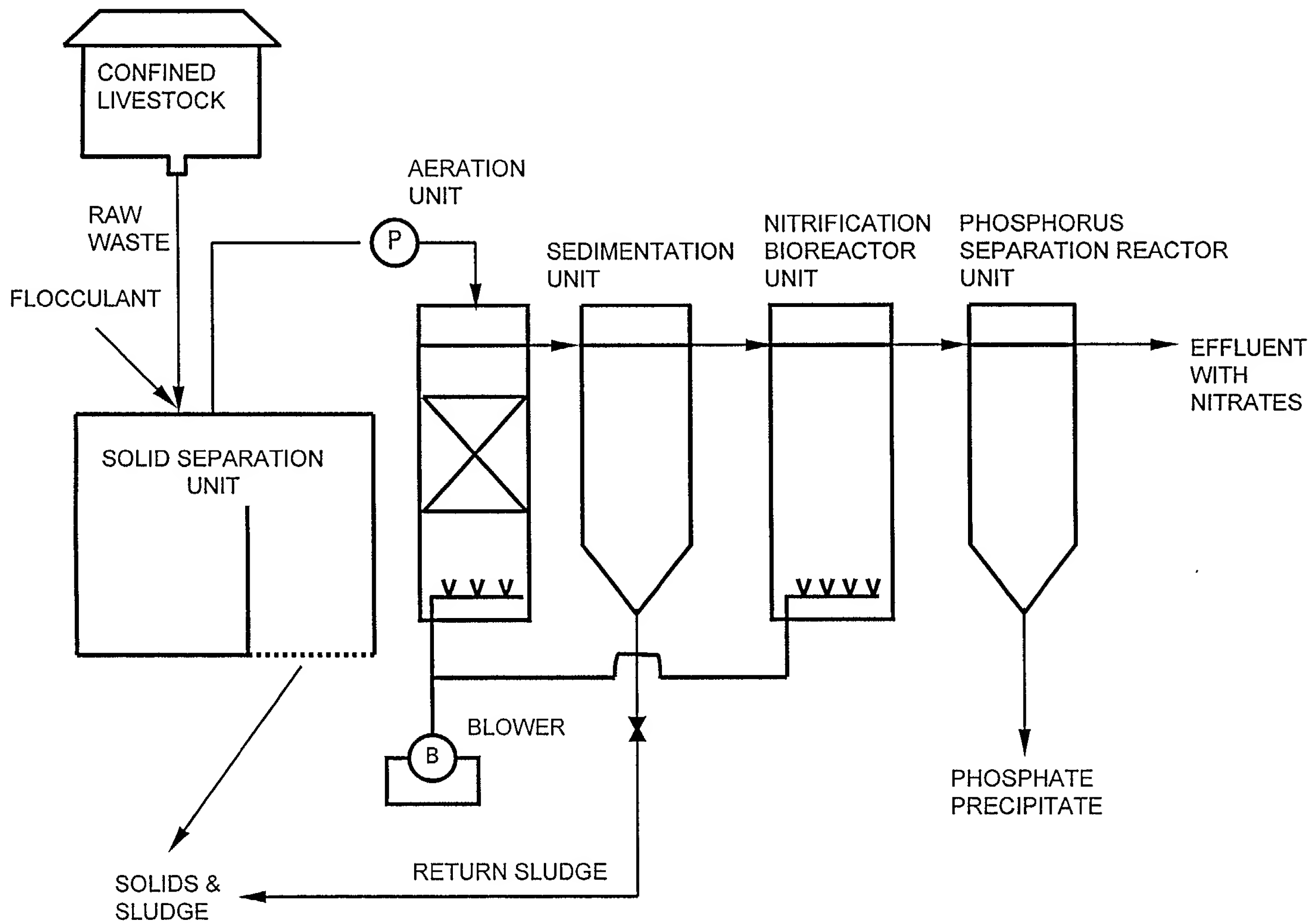

CONFINED
LIVESTOCK
RAW
WASTE
FLOCCULANT
SOLID SEPARATION
UNIT
AERATION
UNIT
P
SEDIMENTATION
UNIT
NITRIFICATION
BIOREACTOR
UNIT
PHOSPHORUS
SEPARATION REACTOR
UNIT
EFFLUENT
WITH
NITRATES
BLOWER
B
PHOSPHATE
PRECIPITATE
RETURN SLUDGE
SOLIDS &
SLUDGE

FIG. 4

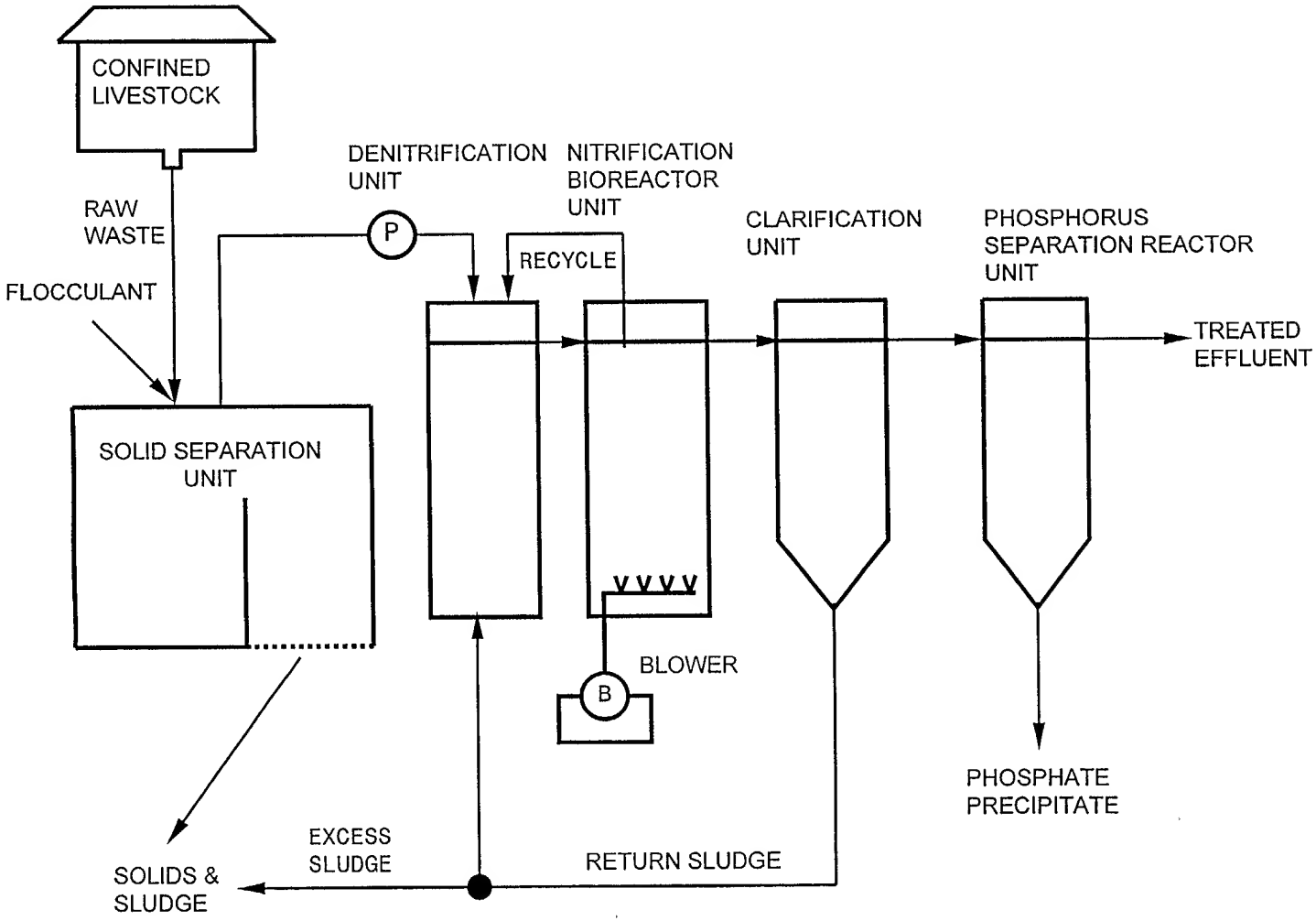
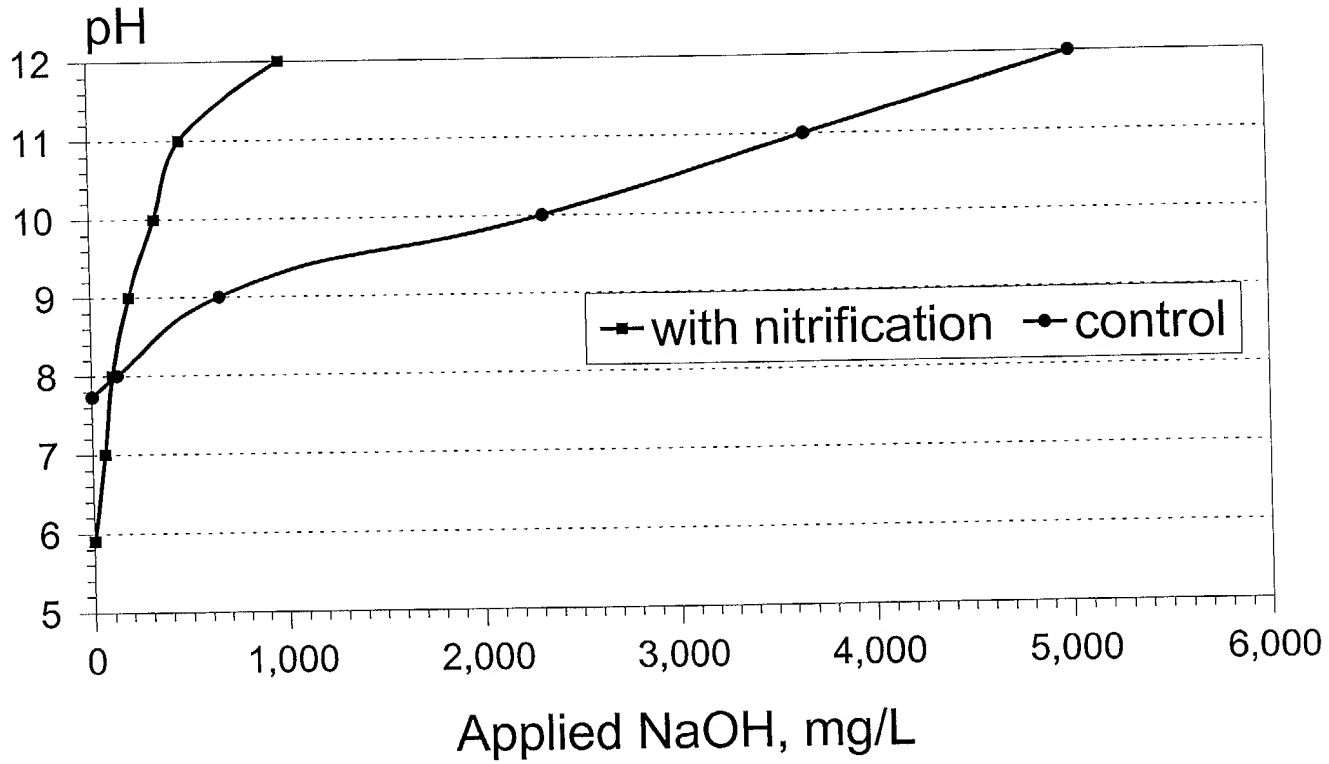


FIG. 5

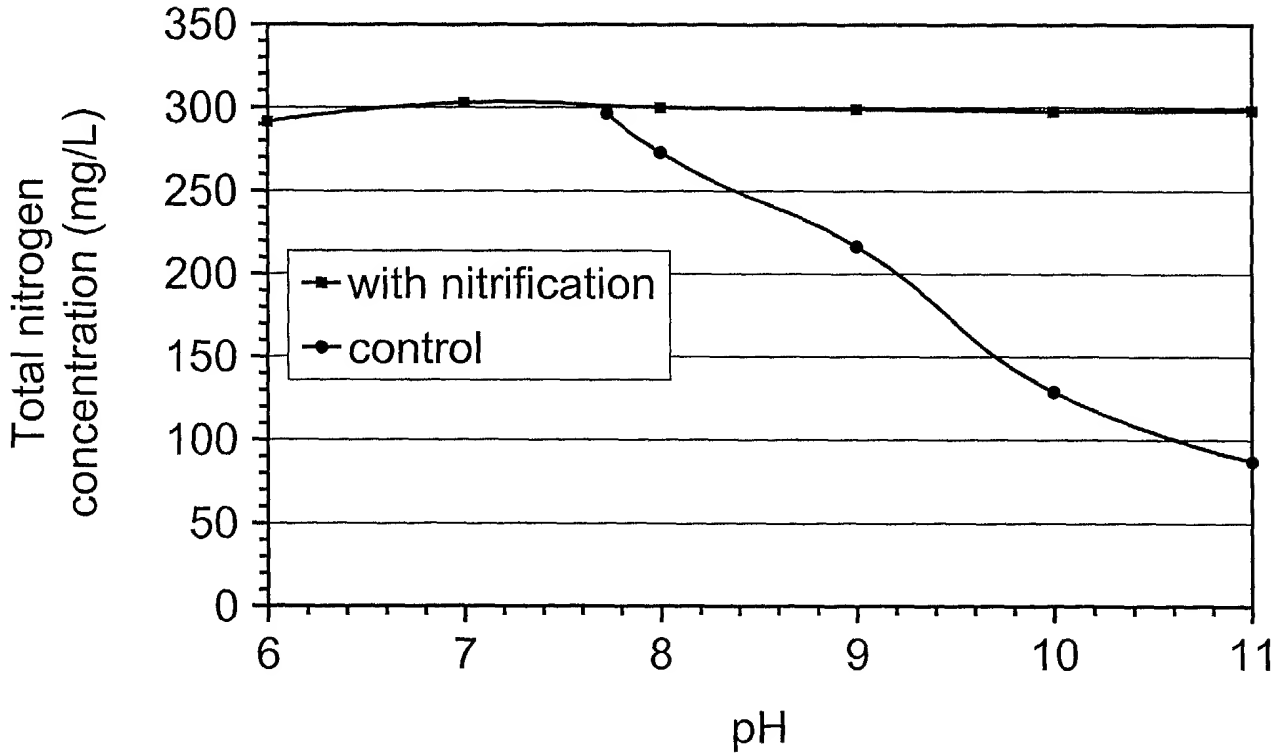


EFFECT OF ALKALI ADDITION ON pH OF SWINE WASTEWATER THAT RECEIVED NITRIFICATION PRETREATMENT VS. CONTROL

FIG. 6

Nitrogen losses in swine wastewater
by ammonia volatilization

FIG. 7



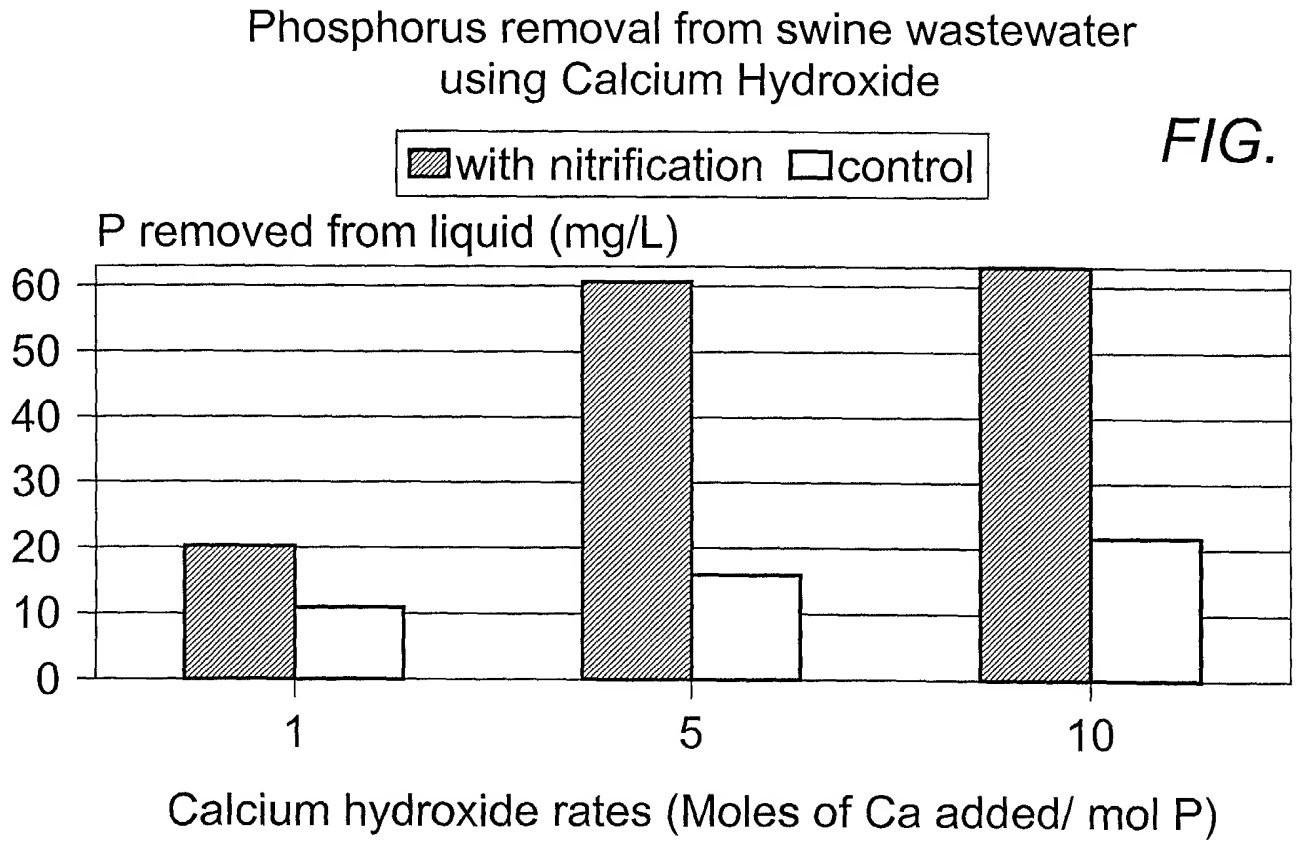


FIG. 8

Initial conditions:
PO_4-P= 63 mg/L, pH= 8.05, alkalinity=1890 mg/L, NH_4-N=300 mg/L
After nitrification:
PO_4-P= 63 mg/L, pH= 6.06, alkalinity=63 mg/L, NH_4-N=61 mg/L

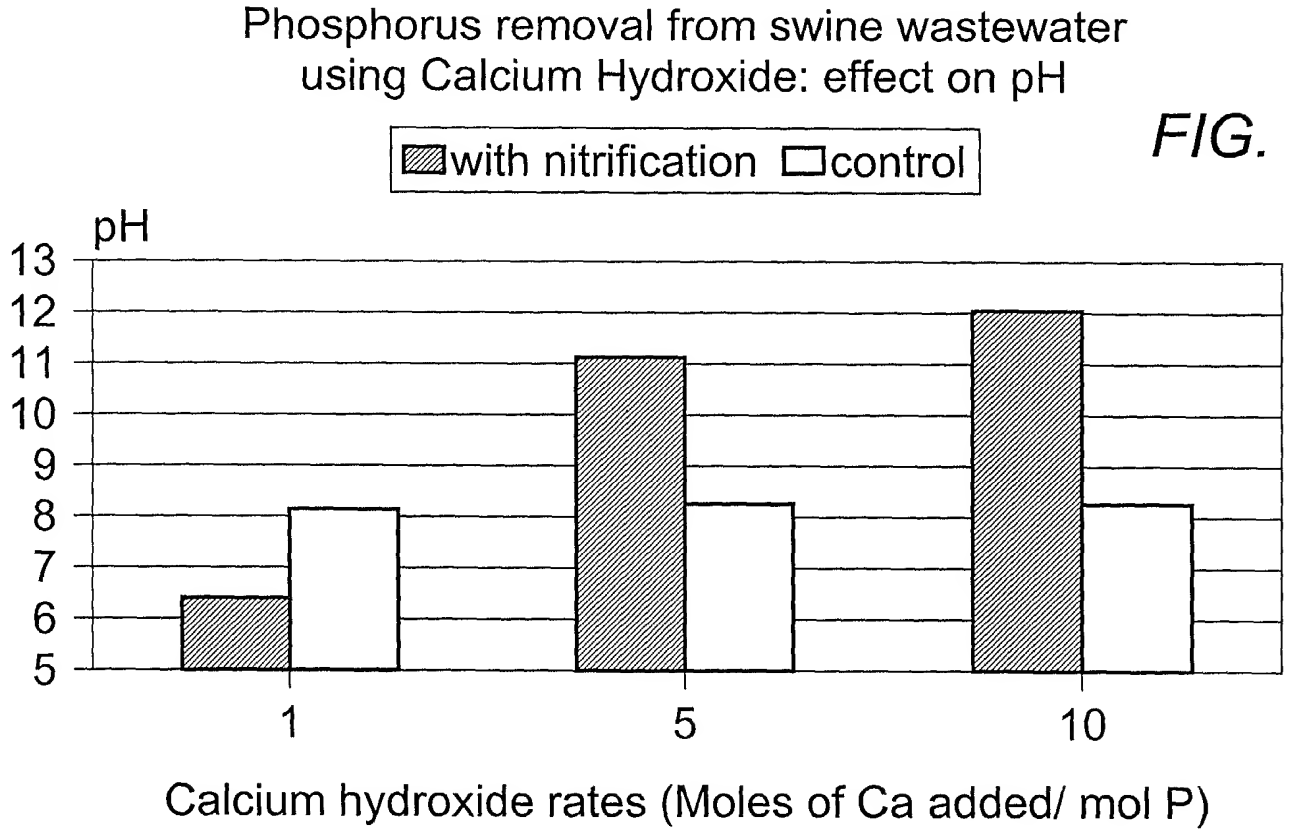
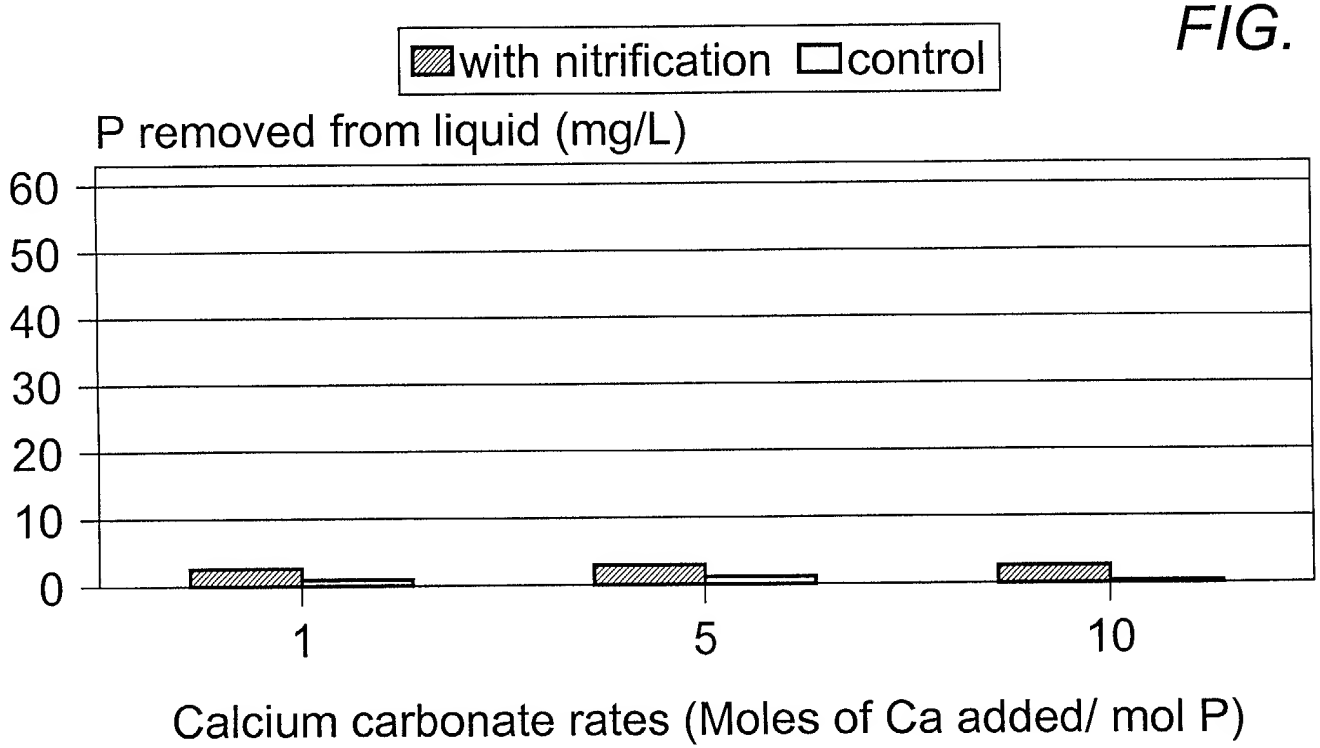


FIG. 9

Initial conditions:
PO_4-P= 63 mg/L, pH= 8.05, alkalinity=1890 mg/L, NH_4-N=300 mg/L
After nitrification:
PO_4-P= 63 mg/L, pH= 6.06, alkalinity=63 mg/L, NH_4-N=61 mg/L

Use of Calcium Carbonate Lime was not effective for removal of phosphorus from swine wastewater

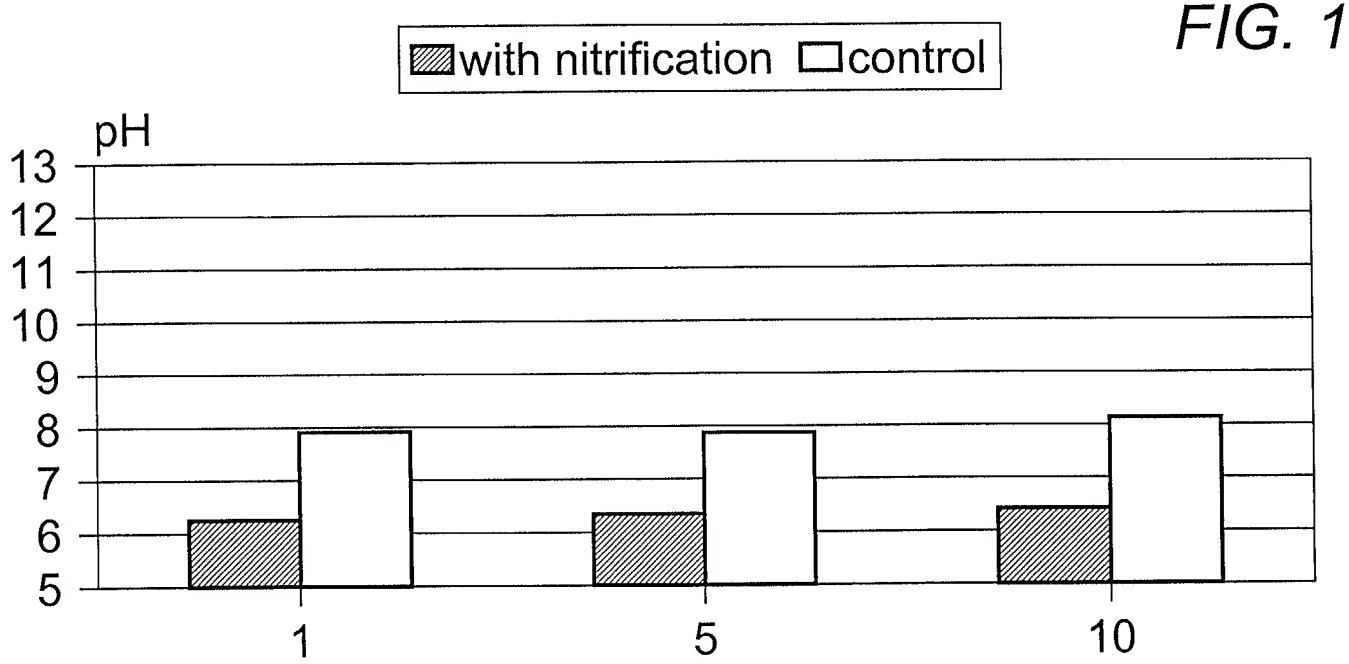
FIG. 10



Initial conditions:
PO_4-P= 63 mg/L, pH= 8.05, alkalinity=1890 mg/L, NH_4-N=300 mg/L
After nitrification:
PO_4-P= 63 mg/L, pH= 6.06, alkalinity=63 mg/L, NH_4-N=61 mg/L

Application of Carbonate lime to swine wastewater did not affect pH or phosphorus removal.

FIG. 11



Initial conditions:
PO_4-P= 63 mg/L, pH= 8.05, alkalinity=1890 mg/L, NH_4-N=300 mg/L
After nitrification:
PO_4-P= 63 mg/L, pH= 6.06, alkalinity=63 mg/L, NH_4-N=61 mg/L